ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Novoferm Nederland Holding B.V.
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Alpha Sectional door ALU 60 with wicket door

Novoferm Nederland Holding B.V.

Institut Bauen und Umwelt e.V.

www.ibu-epd.com / https://epd-online.com

1. General Information

Novoferm Nederland Holding B.V.

Programme holder
IBU - Institut Bauen und Umwelt e.V.
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10178 Berlin
Germany

Declaration number
EPD-NOV-20170069-IAC1-EN

This Declaration is based on the Product Category Rules:
Windows and doors, 11.2015
(PCR tested and approved by the SVR)

Issue date
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Valid to
24.09.2022

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

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(Managing Director IBU)

Alpha Sectional door ALU 60 with wicket door

Owner of the Declaration
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Declared product / Declared unit
1m² Sectional door ALU 60 with wicket door

Scope:
This Environmental Product Declaration (EPD) is valid for Alpha sectional doors of the type ALU 60. The production facilities are located in Didam (NL). The life cycle assessment is representative for the products introduced in the declaration for the given system boundaries.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The CEN Norm /EN 15804/ serves as the core PCR
Independent verification of the declaration according to /ISO 14025/
☐ internally ☒ externally

Dr. Frank Werner
(Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

Sectional doors, type ALU 60, constructed from extruded aluminium sections with thermal separation fitted with 40 mm PMMA (polymethyl methacrylate) triple glazing. The panels are 60 mm thick and available in heights varying between 366 and 732 mm. The horizontal seal retaining profile on the top section is made from aluminium, or supplied with a spray-painted finish (optional). The ALU sections can be combined with insulated, steel-skinned ISO panels.

Surface treatment
The panels are supplied as standard with an anodised finish. They can also be painted in a RAL colour chosen by the customer. This option is covered in the EPD for Sectional door ALU 60 with coating.

Track systems are made of 1.7 mm thick, closed steel angle profiles fitted with roller tracks made of 1.7 mm thick galvanised steel. The door hardware is attached using electrolytically galvanised self-tapping screws with a knurled integral lock-washer. The rollers feature nylon wheels and an 11 mm galvanised steel shaft. The door leaf is balanced via torsion springs and hung on steel cables with a safety factor of 6. Manually operated doors are supplied with a plastic handle and foot plate in the bottom section and a steel shoot bolt, or an optional cylinder lock. Draft seals are fitted around the periphery of the door leaf:

- top, side and floor seals made from EPDM (ethylene propylene diene monomer rubber)
- seals between the panels made from EPDM

Operators
The industrial sectional door can be operated manually by pull cord or chain hoist, or supplied with an electric drive. This option is covered in the EPD for Sectional door ALU 60 with electric drive.

Safety

- emergency chain hoist and emergency drive disconnect up to operator height in the case of electric drives
- cable break safety and/or slack cable safety
- spring break safety
- lift-up prevention

Wicket doors
The industrial sectional door is supplied with an integral wicket door or a pass door next to the

sectional door. The option with a wicket door is covered in this EPD.
For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a Declaration of Performance taking into consideration /EN 13241-1:2003+A1:2011 Industrial, commercial and garage doors and gates — Product standard — Part 1: Products without fire resistance or smoke control characteristics/ and the CE –marking.

2.2 Application

Alpha industrial sectional doors are used in private homes, agricultural buildings, industrial buildings and non-residential buildings. For the application and use the respective national provisions apply. The space-saving industrial sectional door can be fitted to both outdoor and indoor walls. The ALU 60 sectional door is assembled from aluminium panels with a working height of between 366 and 732 mm. When the door is opened, the sections slide back under the roof. The weight of the door leaf is balanced using torsion springs to allow manual operation. In addition to the standard lift track system, high lift, vertical lift, roof following and low headroom systems are available. The industrial sectional door complies with /EN13241-1/ (products without smoke control and fire resistant characteristics)

2.3 Technical Data

Technical details based on a sectional door ALU 60 for an opening of 3800 x 3500 mm (W x H). The presented data comply with those given in the DoP. The different values have been tested by TÜV Nord.

Constructional data

Name	Value	Unit
Heat transfer coefficient window acc. to EN 13241-1/ Annex B and EN 12428	2.8	W/(m^{2}K)
Airborne sound reduction acc. to EN 717-1	21	dB
Air permeability acc. EN 12426	1	class
Resistance to water penetration acc. to EN 12425	1	class
Deflection as a result of wind loads acc. to EN 12424	2	class

Performance data of the product in accordance with the Declaration of Performance with respect to its Essential Characteristics according to /EN 13241-1/.

2.4 Delivery status

The dimensions of the ALU 60 industrial sectional doors amount to a maximum of 8000 mm in width and 6000 mm in height, at a maximum weight of 750 kg.

2.5 Base materials / Ancillary materials

Name	Value	Unit
Acrylate	15	%
Aluminium	2	%
Aluminium, anodised	47	%
Ethylene propylene diene monomer rubber	1	%
Plastics	1	%
Steel, coated	4	%
Steel, galvanized	29	%

2.6 Manufacture

All materials necessary to produce Alpha sectional doors are received and stored in a central warehouse, from where they are internally distributed to the different production areas. Each ALU 60 door is then made to order. In one production area, the door leaf is produced. Activities consist of sawing, mounting, boring and assembly. The panels are supplied as standard with an anodized finish or painted with primer in RAL 9002. The panels can also be painted in any other RAL colour chosen by the customer. After the door leaf has been manufactured and checked, it is internally transported to a different production area, where the rail system, springs and boxes are produced. The rail system is produced by roll formers and is then assembled. Parts needed to mount the door are collected in a box by following a "pick to light" system. After checking for completeness, the door leaf is combined with the rails, springs, boxes and other loose parts. The complete package is then mechanically wrapped in foil and is ready for transportation to the customer.

2.7 Environment and health during manufacturing

The machinery and equipment used are state-of-the art. The Emergency Planning ensures that in the event of an incident, impact on environment and people is kept as low as possible. During manufacturing, waste is separated. Recyclable materials are provided to a third party for recycling.

2.8 Product processing/Installation

The on-site installation is executed by experienced, trained technicians.

2.9 Packaging

The packaging materials used are wood (50%), foil (3%) and cardboard (47%). Possible end-of-life scenarios for these materials are:

- Wood: recycling (5%), incineration (85%), landfill (10%)
- Foil: recycling (85%), incineration (5%), landfill (10%)
- Cardboard: recycling (80%), incineration (15%), landfill (5%)

2.10 Condition of use

During use the composition of the product is not changed. Regular maintenance and care are conditions for a long service life.

2.11 Environment and health during use

There are no emissions to be expected during the use phase, thus no damage to health has to be expected. When properly used, no threats to soil, air and water can occur.

2.12 Reference service life

Sectional doors from Alpha deuren have an expected service life of more than 100.000 cycles, which complies for 10 years of standard daily use and with a recommended yearly service check. The specified service life is independent of the manufacturer's warranty.

2.13 Extraordinary effects

Fire

Fire protection

Name	Value
Building material class	D
Burning droplets	d2
Smoke gas development	s3

Water
The door is not designed for flood protection. No impact is known or expected on ecological water quality on contact by the door with water.

Mechanical destruction
No impact on human health and environment is known or expected, even after mechanical destruction.

2.14 Re-use phase
After the useful life of the aluminum and steel components as for example profiles and components, they can be recycled. The same applies to some plastics. These are then fed through the disposal to recycling.

2.15 Disposal
The doors can be disassembled whereby the metals go for recycling and the plastic parts for energy recovery.

2.16 Further information
For additional information on our sectional doors please visit our websites: Novoferm www.novoferm.nl or Alpha Deuren www.alpha-deuren.nl.

3. LCA: Calculation rules

3.1 Declared Unit
The declared unit of the door is one m2 door. The data are presented per standard door with a width of 3800 mm and a height of 3500 mm. The dimensions for the standard door are chosen because the doors were most frequently sold in these dimensions in the year of 2015.

Declared unit

Name	Value	Unit
Declared unit	1	m²
Conversion factor to 1 door	13,3	
Conversion factor to 1 kg	0.0426	

3.2 System boundary
Type of the EPD: cradle-to-gate.
The production of the materials (steel, plastics, aluminiums, coating etc.) and also the motor-parts and other electronic components are modelled in A1. The transportation (road and sea) from the suppliers to Alpha deuren is modelled in A2. The assembly of the doors (energy use) and the packaging (including the production and transportation of the packaging materials) is modelled in A3. The generation of electricity and heat is modelled in A3. For the option coating is also the coatingprocesses and the emissions of non-methane volatile organic compounds to air modelled in A3.
Production waste from A3 is modelled following the Dutch defaults for waste scenario's (see 4.1.3). This modelling results in components for reuse, materials for recycling.
According to EN 15804 (CEN 2013) the end-of-life system boundary of the construction product system is set where outputs of the system under study, e.g. materials, products or construction elements, have reached the end-of-waste state. Therefore, waste processing of the material flows (e.g. undergoing recovery or recycling processes) during any module of the product system (e.g. during the production stage, use stage or end-of-life stage) are included up to the system boundary of the respective module.
For all phases A1-A3 also processing up to the end-of-waste state or disposal of final residues not leaving the factory gate with the product, are included.

3.3 Estimates and assumptions
All assumptions made during the course of the LCA project and the limitations of the LCA study have been commented in a LCA project report. The results of the LCA have been interpreted in agreement with the goal and scope.
The most important issues are listed below:

- The declared unit of this LCA study has been defined at building element level (door) and calculated back to 1 m^2 door. For all components, the generic /Ecoinvent/ data records of the materials are used, taking into account the country where the components are manufactured.
- The specific transportation distances from the suppliers of the components of the door up to the factory in Didam (NL), are taken into account. For the transportation distances of the raw materials up to the suppliers of the components, however, generic values are used. These generic values are included in the environmental data of the materials in the /Ecoinvent/ database.
- All data used for the production of the door are factory specific. No average values were needed, since the doors are fabricated in one location. For that reason, no large deviations are expected in the production data.
- The data of the amount and mass of the different materials that the door exists of, are based on the most standard dimensions of a door, based on the size of doors most sold in 2015. For this door this is 3.8 by 3.5 meters. It is expected that when other door dimensions are chosen, the proportions of the materials are not changing much and the environmental impact per square meter approaches well enough the exact value for different dimensions of doors.
- Data for waste materials and energy needed during fabrication of the door are based on average factory data. The total amount of

doors produced in 2015 is calculated. The share of waste and energy per door is determined by dividing the values according to the fabrication amount of each door type. Some waste does not apply to certain types of doors and is therefore not assigned to that certain door type. The average values are accurate and it is assumed that the allocation is accurate enough for this LCA-study.

- The processing of the semi-finished products are neglected, at least for the aluminium and steel products.

3.4 Cut-off criteria

All data from the production data acquisition are considered, i.e. all raw materials used as per composition, use of water (no water is used for the production process), electricity and other fuels, the required packaging materials, and all direct production waste. Transport data on all considered inputs and output material are also considered. The packaging waste from semi-finished products that are brought for use in production are not taken into account. No other cut-off criteria were applied to primary information. Infrastructure processes are taken into consideration in the impact estimate.

3.5 Background data

Average background data: for the production of all materials. (/Ecoinvent/ Database version 2012, v2.2 is consulted).

3.6 Data quality

For the production of materials, processes representative for Western Europe are chosen to guarantee the geographical representativeness. The electricity mix of the underlying processes (e.g. production of raw materials which are used in the production process) will, however, not be modified to the Western European version. The processes are used as they are documented in the /Ecoinvent/ database, since the information available by Alpha deuren International B.V. is not more accurate than these processes.

General data have been used from the /Ecoinvent/ database.

3.7 Period under review

All data of the used materials were collected in 2016 and based on annual results of the year 2015. These data are representative for the actual situation. The energy data are also based on the year 2015, and give a representative view of the actual situation, because there have been no changes in manufacturing. The same is true for the production wastes.

3.8 Allocation

In this LCA study, only the end-of-life of the waste materials of the production of the door are considered, because only they reach their end-of-life in the product stage. The environmental benefits that come along with processing the waste, such as recycling in case of the steel and aluminum are not attributed to the initial materials. No benefits of recycling are included in modules A1-A3. There are no internal secondary materials used to manufacture the door.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account. The consulted background database is the /Ecoinvent/ Database version 2012, v2.2..

4. LCA: Scenarios and additional technical information

For the correct quantification of modules C and D in a building assessment it is useful to know that 5,55 kg/m^2 of the sectional door consists of secondary aluminium and 3,27 kg/m^2 of secondary steel.
For the correct quantification of modules A5 in a building assessment it is useful to know that the following packaging materials are used:

- wood: 1,99 kg/m^2
- foil: 0,07 kg/m^2
- cardboard: 1,89 kg/m^2

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1m² Alpha Sectional door ALU 60 with wicket door, per m²

Parameter	Unit	A1-A3
Global warming potential	[kg CO_2-Eq.]	7.31E+1
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.14E-6
Acidification potential of land and water	[kg SO_2-Eq.]	3.57E-1
Eutrophication potential	[kg $(PO_4)^{3-}$-Eq.]	4.17E-2
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	2.21E-2
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	5.75E-4
Abiotic depletion potential for fossil resources	[MJ]	1.12E+3

RESULTS OF THE LCA - RESOURCE USE: 1m² Alpha Sectional door ALU 60 with wicket door, per m²

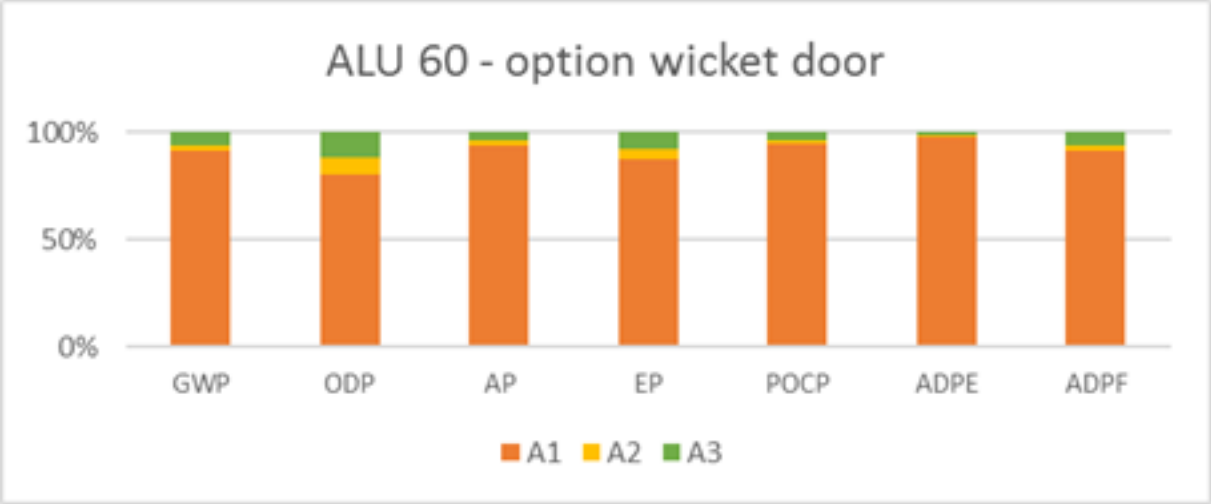
Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	5.45E+1
Renewable primary energy resources as material utilization	[MJ]	6.77E+1
Total use of renewable primary energy resources	[MJ]	1.22E+2
Non-renewable primary energy as energy carrier	[MJ]	6.14E+2
Non-renewable primary energy as material utilization	[MJ]	6.91E+2
Total use of non-renewable primary energy resources	[MJ]	1.31E+3
Use of secondary material	[kg]	1.07E+1
Use of renewable secondary fuels	[MJ]	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0
Use of net fresh water	[m^3]	3.18E+0

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1m² Alpha Sectional door ALU 60 with wicket door, per m²

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	9.12E-3
Non-hazardous waste disposed	[kg]	9.54E+0
Radioactive waste disposed	[kg]	1.95E-3
Components for re-use	[kg]	9.44E-1
Materials for recycling	[kg]	7.07E+0
Materials for energy recovery	[kg]	0.00E+0
Exported electrical energy	[MJ]	0.00E+0
Exported thermal energy	[MJ]	0.00E+0

6. LCA: Interpretation

Phase A1 is in all categories the dominant phase for the environmental impact. The environmental impact of phase A2 and phase A3 is in almost all categories very small.



Since stage A1 is most important for the impact categories, the environmental impact of each material in this stage is calculated.

In most impact categories the contribution of the plastics has the greatest impact. The most important material of the plastics is the polystyrene of the panels. In most impact categories steel and aluminium has a significant impact. In the category abiotic depletion potential – elements (**ADPe**), steel has the greatest impact. The other materials are less important for their environmental impact of the sectional door.

7. Requisite evidence

7.1 Formaldehyde
Not relevant for the sectional door.
7.2 MDI
Not relevant for the sectional door.
7.3 Checking for pretreatment of the substances used
Not relevant for the sectional door.
7.4 Fire gas toxicity
Not relevant for the sectional door.
7.5 VOC emissions
Not relevant for the sectional door.

8. References

ISO 14040
DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
DIN EN ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14040:2006

EN 12424:2000
Industrial, commercial and garage doors and gates – Resistance to wind load – Classification

EN 12425:2000
Industrial, commercial and garage doors and gates – Resistance to water penetration – Classification

EN 12426:2000
Industrial, commercial and garage doors and gates – Air permeability – Classification

EN 12428:2013
Industrial, commercial and garage doors and gates – Thermal transmittance – Requirements for the calculation

EN 13241-1:2003 + A1:2011
Industrial, commercial and garage doors and gates – Product standard – Part 1: Products without fire resistance or smoke control characteristics

EN 13501-1:2007+A1:2009
Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

EN 1628:2011
Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading

EN 1630:2011+A1:2015
Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts

EN 717-1:2013
Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation

Ecoinvent database v2.2
Swiss Centre for Life Cycle Inventories (ecoinvent Centre), EMPA St. Gallen, Lerchenfeldstrasse 5, CH-9014 St. Gallen, www.ecoinvent.org

Regulation (EU) No 305/2011
European union's construction products regulation

PCR Part A
Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. Version 1.5, 2016
www.bau-umwelt.de

IBU PCR Part B
Institut Bauen und Umwelt e.V., Berlin (pub.): PCR Guidance – Texts for Building-Related Products and Services; Part B: Requirements on the EPD for Windows and doors. Version 2017
www.bau-umwelt.com

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin(pub.): Generation of Environmental Product Declarations (EPDs);
www.ibu-epd.de

ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804
EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

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